Exhibit A

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[redacted]

On the use of semiconductor nanocrystallites as fluorescent tags in biological systems.

This idea is on the use of semiconductor nanocrystallites as site specific fluorescent tags in biological systems, specifically crystallites of CdSe as synthesized by the methods developed in my laboratory and overcoated with a higher band gap semiconductor as developed in my laboratory in collaboration with Prof. Klaus Jensen. The idea is to first change the overcoat of the particles to make them water soluble, for example by using a phosphine oxide or phosphate which is derivatized with an alkane group with a charged group such as a carboxylic acid or ammonium salt. These particles will retain their high luminescence efficiency, be water soluble, and through the carboxylic acid group, be able to bind to commercially or custom synthesized antibodies to tag specific sites in biological systems. The primary advantage of our particles is that they can be synthesized with a fluorescence that is tunable over the visible spectrum and with a linewidth which is significantly narrower that commercially available organic dyes. Other advantages are: 2) that only one wavelength is required to excite all the different size particles as long as this wavelength is to the blue of the fluorescence of the smallest particle in the sample, 3) the particles should in principle be more robust than organic dye molecules, 4) the photodegradation products are inorganic and may not interfere with the biochemistry of the system being studied the way organic dyes do. The status of the project is that we are able to make water soluble particles using a thiol derivatized with a sulfonate. The thiol group binds to the particle and the sulfonate makes them water soluble. These particles are however not luminescent. We are in the process of synthesizing phosphine based ligands with carboxylates and ammonium salt groups which should not quench the luminescence of the particles, yet have them be water soluble and in a form to be incorporated into a biological system.

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Jin-Kyu Lee (Jin-Kyu Lee) [redacted]

I have read and understood.